

REMARKS

Claims 1-9 are pending and stand ready for further action on the merits. Claims 1 and 2 have been amended to recite an upper limit of 10 vol % in the range for the concentration of cashew dust. Support for this amendment can be found in the present specification at page 6, line 14 and Table 1.

Support for new claims 7-9 can be found in claims 4 and 5. No new matter has been added by way of the above-amendment.

Advantages of the Present Invention

The inventive material is a non-asbestos friction material obtained by molding and curing a composition comprising a fibrous base other than asbestos, a binder and a filler, wherein the filler includes 0.5 to 10 vol % of cashew dust based on the overall composition. In a non-limiting embodiment, these friction materials can be used as brake pads for vehicles. The advantages to using the inventive composition in brake pads include:

- (i) Noise generation due to rocking of the vehicle at the end of brake application is markedly reduced;
- (ii) Noise generation due to swaying of the vehicle is greatly reduced;

- (iii) Heat resistance is improved;
- (iv) Braking effectiveness is stabilized; and
- (v) Attack of mating surface (drum) against which friction takes place is reduced.

The criticality of the concentration range of 0.5 to 10 vol % of cashew dust in the non-asbestos friction materials of the present invention can be seen in the experimental results which are given in the specification. As further evidence of the criticality of this range, Applicants enclose herewith a Declaration Under 37 C.F.R. § 1.132 by Mr. Iwao Saikatsu. The results are described in Tables 1 and 2' given below for the Examiner's convenience.

Table 1

	Example ^a							
	1	2	3	4	5	6	7	8
Aramid fibers	10	10	10	10	10	10	10	10
Potassium titanate fibers	3	5	7	15	10	7	5	3
Glass fibers	5	3	1	-	-	-	-	-
Rock wool	-	-	-	-	-	-	-	-
Phenolic resin	15	15	15	15	15	15	15	15
Cashew dust	7	5	3	10	7	5	3	10
Other organic fillers	15	15	15	15	15	15	15	15
Inorganic fillers	45	47	49	35	43	48	52	47
Total (vol %)	100	100	100	100	100	100	100	100
Friction coefficient	0.38	0.37	0.36	0.40	0.39	0.37	0.36	0.39
Wear	good	good	good	very good	good	good	good	very good
Squeaking, Noise	good	good	very good	good	very good	very good	very good	good

a - The data from Inventive Examples 1-8 can be found on page 10 of the specification.

Table 2'

	Example ^b			Comparative Example ^b				
	9	10	11	1	2	3	4	5
Aramid fibers	10	10	10	10	5	5	10	10
Potassium titanate fibers	1	3	1	-	25	15	3	3
Glass fibers	-	-	1	15	-	5	-	-
Rock wool	5	3	1	-	-	-	-	-
Phenolic resin	15	15	15	15	20	20	15	15
Cashew dust	7	5	3	20	20	20	13	15
Other organic fillers	15	15	15	15	-	-	15	15
Inorganic fillers	47	49	54	25	30	35	44	42
Total (vol %)	100	100	100	100	100	100	100	100
Friction coefficient	0.38	0.37	0.36	0.42	0.41	0.42	0.40	0.40
Wear	good	good	good	very good	very good	very good	very good	very good
Squeaking, Noise	very good	very good	very good	poor	poor	poor	fair	fair

b - The data from Inventive Examples 9-11 and Comparative Examples 1-3 can be found on page 10 of the specification. The data from Comparative Examples 4 and 5 can be found in the enclosed Declaration.

As can be seen from the above data, brake pads which are prepared with materials containing a filler of 0.5 to 10 vol % of cashew dust, as presently claimed, have a lower friction coefficient and a reduced amount of squeaking/noise during use than brake pads containing materials having a filler of greater than 10 vol % of cashew dust. For example, in Inventive Examples 4 and 8 which contain 10 vol % of cashew dust, the squeaking and noise evaluation is "good". This is in distinction to the findings for Comparative Examples 4 and 5 which incorporate 13 and 15 vol %, respectively, of cashew dust. In these Comparative Examples, the squeaking and noise evaluation are "poor" or "fair". Applicants respectfully submit that this improvement is neither taught nor fairly suggested in the cited references.

Applicants now turn to each of the cited references and provide comments as to the patentable distinctions between the present invention and the teachings therein.

Sasaki et al., USP 6,080,230

Claims 1-5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Sasaki et al. Applicants respectfully traverse the rejection.

In order to distinguish from Sasaki et al., Applicants have amended claims 1 and 2 to recite that the cashew dust is present in the overall material in a concentration of 0.5 to 10 vol %. Sasaki et al. generically teach that cashew dust can be included in the filler in column 3, lines 61-65. However, there is no further guidance as to the preferred concentration range of the cashew dust except for the single exemplified embodiment in Table 1 of column 5, wherein cashew dust is added in a proportion of 13 vol %.

In describing the requirements for rejection of a claim by anticipation, the Manual of Patent Examining Procedure (Section 2131) states:

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference (ref. omitted). The identical invention must be shown in as

complete detail as is contained in the... claim (ref. omitted).

Accordingly, Applicants respectfully indicate, every element in a claim must be found in the reference in order that the reference anticipates the claim. Sasaki et al. are silent with respect to the cashew dust concentration other than the value of 13vol% as shown in Table 1. Therefore, the reference does not anticipate the claims, and as such, Applicants respectfully request that the rejection be withdrawn.

Further more, Applicants respectfully submit that the inventive claims are not made obvious under 35 U.S.C. § 103(a) by Sasaki et al., since Sasaki et al. fail to teach or fairly suggest the use of cashew dust in the inventive range of 0.5 to 10 vol %, nor the unexpected improvements thereof as shown in the enclosed Rule 132 Declaration when Comparative Example 4 having 13vol% cashew dust is used as a basis for comparison.

Hara et al., USP 6,220,404

Claims 1-5 are rejected under 35 U.S.C. § 102(e) as being anticipated by Hara et al. Applicants respectfully traverse the rejection.

In order to distinguish from Hara et al., Applicants have amended claims 1 and 2 to recite that the concentration of the

cashew dust is in a range of 0.5 to 10 vol %. Hara et al. generically teach in column 4, lines 30-42, that a friction adjusting agent is added to the materials for the disk brake pads in a concentration range of 20 to 70 vol %. Also, in each of the exemplified embodiments of Hara et al., cashew dust is incorporated into the materials at a concentration of 15 vol %.

As mentioned above, every element in a claim must be found in the reference in order that the reference anticipates the claim. Hara et al. fail to teach or suggest the use of cashew dust in a concentration lower than 15 vol %. Accordingly, the reference does not anticipate the claims, and as such, Applicants respectfully request that the rejection be withdrawn.

Furthermore, Applicants respectfully submit that the inventive materials are not made obvious by Hara et al. under 35 U.S.C. § 103(a), since Hara et al. does not fairly suggest the use of cashew dust in a range of 0.5 to 10 vol % nor the unexpected improvements thereof as shown in the enclosed Rule 132 Declaration when Comparative Example 5 having 15vol% cashew dust is used as a basis for comparison.

Kinouchi et al., USP 6,372,817

Claims 1, 2, 4 and 5 are rejected under 35 U.S.C. § 102(e) as being anticipated by Kinouchi et al. Applicants respectfully traverse the rejection.

In the section numbered as "4" of the outstanding Office Action, the Examiner indicates that the materials described in Table 1 of Kinouchi et al. anticipate the presently claimed invention. Based on the following comments, Applicants respectfully submit that the exemplified embodiments of Kinouchi et al. do not anticipate the presently claimed invention, since the exemplified embodiments do not contain cashew dust in a range of 0.5 to 10 vol %. As the Examiner will note, the concentration of cashew dust used in the materials of Kinouchi et al., are described using "weight%" units and not "volume%" units as presently claimed. Upon conversion of the "weight%" units of Kinouchi et al. to "volume%" units, it is clear that the amount of cashew dust used in the materials of Kinouchi et al. do not anticipate the present claims.

In Table 1 of Kinouchi et al., the quantity of cashew dust is 10.0 weight%. 10.0 weight% of cashew dust (Example 1) can be converted to about 19 vol % based on the information given in the following Table.

Example 1 of Kinouchi et al.	Weight g	Specific Gravity g/cc	Volume cc	Volume Percent Vol %
Copper fiber	20.0	8.5	2.35	5.8
Ceramic fiber	10.0	2.8	3.57	8.8
Aramid fiber	5.0	1.4	3.57	8.8
Potassium titanate fiber	6.0	3.5	1.171	4.2
Phenolic resin	12.0	1.3	9.23	22.7
NBR powder	2.5	1.0	2.50	6.1
Graphite	7.0	2.2	3.18	7.8
Barium sulfate	22.5	4.5	5.00	12.3
Diantimony trisulfide	5.0	4.6	1.09	2.7
Cashew dust prior to coating with a liquid IR (dust content 91 wt%)	9.1	1.2	7.58	18.6
Liquid IR for coating Cashew dust (IR content 9 wt%)	0.9	1.0	0.90	2.0
Total (vol %)	100	-	40.69	100

* The specific gravity of each of above-described components was found using the description of the trademarks given in column 7 of Kinouchi et al.

* Cashew dust coated with a liquid IR consists of 100 parts by weight of dust content and 10 parts by weight IR content, as described in Example 1 of Kinouchi et al.

* Volume (cc) = Weight(g)/Specific Gravity (g/cc)

* Volume percent (vol%) = Volume (cc)/40.69

Thus, it is calculated by the above described Table that the volume percent of cashew dust (without the liquid IR coating) is 18.6 vol %. Furthermore, if the vol% of the liquid IR coating is taken into consideration, the total is about 20.6 (18.6 + 2.0) vol%. Either way the value is calculated, the amount is much higher than the upper limit of 10 volume % in the present invention.

Thus, the present invention differs from Kinouchi et al. in the volume percent of cashew dust.

As noted above, every element in a claim must be found in the reference in order that the reference anticipates the claim. Kinouchi et al. fail to provide an exemplified embodiment in which

the concentration of the cashew dust falls within the inventive range of 0.5 to 10 vol %. Accordingly, Kinouchi et al. fails to anticipate the presently claimed invention and withdrawal of the rejection is respectfully requested.

Applicants are aware of the fact that Kinouchi et al. generically teaches that the cashew dust coated with liquid rubber can be present in the friction material composition in a concentration of 3-30 weight % based upon the total mass of the friction material composition, see column 3, lines 5-10. However, Applicants respectfully submit that based upon a proper analysis under 35 U.S.C. § 103(a), the presently claimed invention would not be found obvious. First, the analysis would take into consideration that this "weight%" range must be converted to "volume%", which would increase the values in the range. Second, the fact that the exemplified embodiments incorporate a much higher concentration of cashew dust must be considered as a teaching away from the lower end of the concentration range. Third, the unexpectedly superior properties of the materials incorporating cashew dust in the range of 0.5-10vol% must be considered. Based on a proper analysis, Applicants respectfully submit that Kinouchi et al. does not make the presently claimed invention obvious under 35 U.S.C. § 103(a).

Issues Under 35 U.S.C. § 103

Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Sasaki et al., Hara et al. or Kinouchi et al. in view of Kobayashi et al., USP 5,383,963. Applicants respectfully traverse the rejection.

The patentable distinctions between the present invention and the teachings of Sasaki et al., Hara et al. and Kinouchi et al. as described above, are herein incorporated by reference.

The Examiner cites Kobayashi et al. for teaching that it would be obvious to modify the materials of Sasaki et al., Hara et al., or Kinouchi et al. by incorporating fibers having specific dimensions. However, Applicants respectfully submit that Kobayashi et al. do not cure the deficiencies of Sasaki et al., Hara et al. or Kinouchi et al. Specifically, Kobayashi et al. fail to teach or fairly suggest the use of cashew dust in the inventive range of 0.5 to 10 vol %.

As the MPEP directs, all the claim limitations must be taught or suggested by the prior art to establish a *prima facie* case of obviousness. See MPEP § 2143.03. Since the combined references fail to teach or fairly suggest the use of cashew dust in a concentration range of 0.5 to 10 vol %, as presently claimed, or the unexpectedly improved properties of materials incorporating

cashew dust in this range, a *prima facie* case of obviousness cannot be said to exist. As such, withdrawal of the rejection is respectfully requested.

Information Disclosure Statement (IDS)

On July 11, 2002, Applicants timely filed an IDS. However, it appears that the Examiner made an oversight and did not initial next to the four non-U.S. Patents listed on the PTO-1449 Form. Accordingly, Applicants enclose herewith a supplemental PTO-1449 Form which lists said four non-U.S. patent documents. Applicants respectfully request that the Examiner initials and signs the supplemental PTO-1449 Form and forwards this document with the next communication.

Conclusion

In view of the above amendments and comments, Applicants respectfully submit that the claims are in condition for allowance. A Notice to such effect is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen, Ph.D., Esq. (Reg. No. 43,575) at the telephone number of the undersigned below, to conduct an

interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachments: Declaration of Iwao SAIKATSU
PTO-1449 Form

(Rev. 09/30/03)